Uspekhi Fiziologicheskikh Nauk 2007 vol.38 N3, pages 47-56

RNA-interference in the regulation of axonal transport

Islamov R., Rizvanov A., Chelyshev Y., Murashov A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Until now, in the world since literature, there has been no direct evidence indicating that RNA-interference controls local protein synthesis in the mammalian motor neuron axons. In the present review we have summarized the results on intraaxonal protein synthesis, its role in the axonal transport, and mechanisms regulating local protein synthesis in the axoplasm. The new mechanisms regulating axonal transport based on RNA-interference presented in the review let us discuss the questions about pathogenesis of the neurodegenerative diseases. The estimated role of the intraaxonal protein synthesis on axonal transport suggested applying short interfering RNA for degradation of the mutant gene RNA for blocking synthesis of the aberrant protein along the whole axon.